Forest Transitions and the Energy Ladder in India from the Early 1990’s to Present
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Most poor households in the developing world rely on traditional biofuels for cooking and heating. In India, 75% of rural households use wood as the primary source of cooking fuel. In urban areas, the percentage is lower (22%) but still substantial.

Studies in the 1970s and 80s projected massive deforestation from a widening gap between fuelwood demand and production in forests. The projected shortfall did not materialize due to miscalculations about fuelwood resources and consumption. This early conception that fuelwood use contributes to the deforestation stage of the forest transition has not proven to be reality. Rather, some case studies suggest that fuelwood scarcity promotes forest cover through tree-planting on private property and community management of forest plantations.

Trends in the 1990s and 2000s indicate a complex relationship between energy and forest transitions in India. In general, forest cover has increased slightly or remained constant in most districts. The proportion of urban households using modern fuels (LPG and kerosene) as the primary cooking fuel increased from 53 to 68% with improved distribution and rising incomes. In rural areas, adoption of modern fuels is much lower but has doubled from 5 to 10% between 1993 and 2005. Adoption of modern fuels occurs across income strata in urban areas. In rural areas, adoption appears restricted to higher income strata.

Several questions arise from these trends:
- Does fuelwood scarcity contribute to a switch from traditional to modern fuels if income is not a constraint?
- Does fuelwood scarcity contribute to forest regeneration or decline if income constrains adoption of modern fuels?
- Is a switch from traditional to modern fuels a positive or negative feedback to forest regeneration?

On one hand, one could argue that the switch from traditional to modern fuels acts as a positive feedback to forest regeneration as degradation from biomass removal declines. On the other hand, a negative feedback could ensue if the switch reduces dependence on tree cover and favors competing land uses.

The analysis will address these questions at the national level disaggregated by state and by district where data permit. Data from the Indian National Sample Survey Organization from 1993 to 2005 indicate proportion of households using various fuel types at five year intervals at the state level. Biannual State of the Forest reports estimate forest cover from satellite analysis, although changing methodologies and resolutions only allow direct comparison of changes in forest cover since 2001. Available data from several highly-urbanized Union Territories (Delhi, Goa, and Pondicherry) make it possible to examine the questions for urban settings. The relationships will identify whether, and in which conditions, trends in energy and forest transitions are parallel or opposing in India for the last twenty years.